

# **Brookhaven National Laboratory Shotgun Range**

## **Facility Environmental Monitoring Report Calendar Year 2001**



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**Brookhaven National Laboratory  
Shotgun Range  
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***Summary of Results:** Analysis of groundwater samples collected at the Shotgun Range during CY 2001 indicates that range operations have not impacted groundwater quality. Groundwater analyses indicate that all metals (including lead) are at concentrations that are consistent with established background levels.*

## **Background**

The BNL shotgun range is utilized for (clay) trap and skeet target shooting by the Brookhaven Employees Recreation Association (BERA). The shotgun range is located in an isolated, wooded area north of the new Waste Management Facility. The range was established by the BERA in 1974. Clay targets are thrown south from the trap house into an open field that is approximately 205 feet east-west by 410 feet north-south (Figure 1). Although most of the shot falls within the cleared range, shooting from several of the trap line positions results in the deposition of some of the shot into the nearby wooded areas.

From 1974 until 2000, the types of shotgun shells used at the facility typically contained lead pellet. It is estimated that as many as 30,000 shotgun rounds per year have been used at the range. At an average of 1.125 oz. per round, as much as 2,100 pounds of lead may have been deposited on the surface of the range annually. To prevent additional deposition of lead, in early 2000 BNL implemented a rule that allows only steel shot to be used at the range.

## **Environmental Monitoring Program**

In accordance with DOE Order 5400.1 (Environmental Protection), BNL established a groundwater monitoring program at Shotgun Range to evaluate potential impacts of range operations on environmental quality. In January 2000, BNL installed two wells (046-02 and 046-03) to improve its ability to monitor groundwater quality directly downgradient of the range. The groundwater monitoring program for the Shotgun Range is described in the BNL Environmental Monitoring Plan (Daum *et al.* 2000; BNL, 2001).

## **Monitoring Results**

During CY 2001, groundwater monitoring wells at the Shotgun Range were sampled in March. All metals concentrations were below the applicable New York State Ambient

Water Quality Standards (NYS AWQS) and were consistent with established background levels (Table 1).

## **Future Monitoring Actions**

The following actions are recommended:

- Continue with collecting groundwater samples on an annual basis for CY 2002, and test only for metals.
- Consider reducing the groundwater monitoring program from an annual schedule to once every two years starting in CY 2003.

## **References**

BNL, 2001. Brookhaven National Laboratory Environmental Monitoring Plan, CY 2001 Update (January 2001). BNL-52584 Update.

Daum, M., Dorsch, W., Fry, J., Green, T., Lee, R., Naidu, J., Paquette, D., Scarpitta, S., and Schroeder, G., 2000. Brookhaven National Laboratory, Environmental Monitoring Plan 2000 (March 31, 2000).

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Shotgun Range  
Groundwater Monitoring Program  
Metals Analytical Results for CY 2001  
Table 1**

Well	Sample Period	Ag (mg/L)	Al (mg/L)	Cd (mg/L)	Cr (mg/L)	Cu (mg/L)	Fe (mg/L)	Hg (mg/L)	Mn (mg/L)	Na (mg/L)	Pb (mg/L)	Zn (mg/L)
046-01 (a)	March	<0.001	0.008	<0.001	<0.001	0.002	<0.075	<0.0001	0.003	4.9	<0.0013	0.041
046-02	March	<0.001	0.062	<0.001	<0.001	0.004	<0.075	<0.0001	0.005	3.8	<0.0013	0.038
046-03	March	<0.001	0.018	<0.001	<0.001	<0.002	<0.075	<0.0001	0.003	3.4	<0.0013	0.020
Typical MDL		0.001	0.002	0.001	0.001	0.002	0.075	0.0001	0.002	1.0	0.001	0.004
NYSAWQS		0.05	0.1	0.01	0.05	0.2	0.3	0.0007	0.3	20	0.025	0.3

(a): Well 046-01 is located immediately upgradient of the shotgun range.

Note: Primary potential contaminants shown. Other metals were analyzed for – see database for complete data set

MDL: Minimum Detection Limit.

